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--85. (New) A method of developing a three-dimensional cone beam volume computed tomography image of a breast of a patient, the method comprising:

(a) providing a device for performing cone beam volume computed tomography imaging, the device comprising a cone beam radiation source and a two-dimensional area detector;

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(b) disposing the breast in a path of cone beam radiation between the source and the detector;

(c) using the device to obtain a volume scan of the breast by synchronously rotating the source and the detector around an axis passing through the breast to form a data acquisition geometry for cone beam volume computed tomography, the volume scan resulting in image signals; and

(d) forming the three-dimensional tomographic image from the image signals by performing a cone beam volume computed tomography reconstruction on the image signals to produce a three-dimensional attenuation coefficient distribution of the breast.

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86. (New) The method of claim 85, wherein step (c) is performed at an effective energy of 33-40 keV.

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87. (New) The method of claim 85, wherein step (c) is performed at a total dose level equal to or less than a total dose level of a single conventional mammography examination.

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88. (New) The method of claim 85, wherein, during step (c), the breast is not laterally compressed.

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89. (New) The method of claim 88, wherein, during step (c), the breast is compressed into a cylindrical shape.

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90. (New) The method of claim 85, wherein a carcinoma is detected in the breast in accordance with a difference in the x-ray linear attenuation coefficient between the carcinoma and a surrounding tissue in the breast.

91. (New) The method of claim 85, wherein a tumor in the breast is distinguished as a carcinoma or a benign tumor in accordance with a border pattern of said tumor.

92. (New) The method of claim 85, wherein the three-dimensional image comprises a plurality of planes, and wherein a breast tumor in one of said planes is tomographically isolated from other objects in adjacent ones of said planes.

93. (New) The method of claim 85, wherein steps (c) and (d) are performed multiple times to measure a change in a volume of a lesion, whereby a carcinoma is distinguished from a benign tumor in accordance with different growth rates between the carcinoma and the benign tumor.

94. (New) The method of claim 85, wherein a contrast medium is used to assess lesion vascularity and enhancement rate in a lesion in the breast, whereby a carcinoma is distinguished from a benign tumor in accordance with different contrast enhancement rates between the carcinoma and the benign tumor.

95. (New) The method of claim 85, wherein a contrast medium is used to assess breast tumor angiogenesis non-invasively.

96. (New) The method of claim 85, wherein the three-dimensional image obtained in step (d) is fused with real-time two-dimensional images obtained with the device in an image-guided biopsy procedure.

97. (New) A device for producing a three-dimensional cone beam volume computed tomography image of a breast of a patient, the device comprising:

a gantry frame;

at least one motor for rotating the gantry frame to form a data acquisition geometry for cone beam volume computed tomography so as to obtain a volume scan of the breast;

a source of cone beam radiation attached to the gantry frame to rotate synchronously with the gantry frame;

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a two-dimensional area detector attached to the gantry frame to rotate synchronously with the gantry frame and the source, the detector being disposed in a path of the cone beam radiation to take image signals of the breast;

a support on which the patient rests while the image signals are taken, the support supporting the patient such that the breast is disposed between the source of radiation and the detector; and

a computing device, receiving the image signals, for forming the three-dimensional cone beam volume computed tomography image from the image signals by performing a cone beam volume computed tomography reconstruction on the image signals to produce a three-dimensional attenuation coefficient distribution of the breast.

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98. (New) The device of claim 97, wherein the source outputs the cone beam radiation at an effective energy of 33-40 keV.

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99. (New) The device of claim 97, wherein the source outputs the cone beam radiation at a total dose level equal to or less than a total dose level of a single conventional mammography examination.

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100. (New) The device of claim 97, wherein the detector is a detector capable of acquiring both static digital images and dynamic images.-

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101. (New) The device of claim ~~100~~, wherein the detector is a thin-film transistor array flat panel detector.

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102. (New) The device of claim ~~100~~, wherein the detector is a digital area detector having a resolution of equal to or more than 1 lp/mm.

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103. (New) The device of claim ~~97~~, wherein the at least one motor comprises motors for moving the gantry frame to implement one of a circle-plus-line scan, a quasi-spiral scan and a spiral scan.

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104. (New) The device of claim ~~97~~, wherein the computing device is capable of forming the three-dimensional tomographic image with isotropic resolution.

REMARKS

At the outset, the Applicant acknowledges with appreciation the courtesy shown by the Examiner during the telephone interview conducted May 23, 2002. During the interview, proposed claims 85-104 were discussed. It was agreed that even though the prior art may include separate teachings directed to CBVCT and breast imaging, the prior art would not have taught or suggested using the former to achieve the latter. With regard to those claims not limited to CBVCT, no agreement was reached, although the Examiner indicated that he would reconsider the outstanding grounds of rejection in light of the arguments presented.

The Office Action dated December 11, 2001, has been carefully considered. In response thereto, the present application has been amended in a manner which is believed to place it into consideration for allowance. Accordingly, reconsideration and withdrawal of all outstanding grounds of rejection and issuance of a Notice of Allowance are earnestly solicited in view of the foregoing amendments and the following remarks.

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